Iowa Department of Natural Resources
Flood Plain Management Program

Project Information Checklist for Earth Embankment Dams

In order for an application for an earth embankment dam to be considered complete and to allow the Department to undertake a review of the project, all of the items listed below must be submitted. An application is not placed in the review queue until all of the required items are received.

____ Completed and signed DNR Form 36, *Joint Application Form – Protecting Iowa Waters*. Please indicate if the project site is inside the incorporated limits of a city by using the word 'in' when listing the city in item 7 of the application. The application can be found online at the following link. http://www.iowadnr.com/water/floodplain/index.html

____ Statement describing the purpose of the structure.

____ Water storage permit application (if the permanent storage exceeds 18 acre-feet).

____ Topographic map showing the location of the dam and the entire drainage basin.

____ Duplicate sets of engineering plans for the project. Please note that the plans must be prepared and certified by a professional engineer licensed in the State of Iowa. The design plans shall include, but not be limited to, the following information.

- A to-scale site plan showing the proposed dam and impoundment, location of the spillways and the location of the property lines, roads, houses, buildings or other pertinent physical features.
- A cross section of the embankment along its longitudinal axis showing natural ground, core trench limits, emergency spillway and the top of dam - pre and post settlement.
- A typical cross section through the embankment along the centerline of the principal spillway showing the embankment side slopes, top width, core trench (cutoff trench) dimensions, the spillway conduit – inlet and outlet configuration and the use of anti-seep collars or drainage diaphragm on the conduit.
- Detail of any foundation/ embankment drainage system.
- Description of the spillway conduit including the size and type of conduit, bedding and joint detail.
- Details of the principal spillway stilling basin.
- Profile of the emergency spillway showing the inlet, control and exit sections. Include a plan view and cross section of any dike used in conjunction with the emergency spillway to divert emergency spillway flow away from the toe of the embankment.
- Bench mark descriptions, including datum reference.

____ Duplicate sets of project/construction specifications.

____ Impoundment capacity (stage-storage table to the top of dam elevation).

____ Description and assumptions for basin hydrology and structure hydraulics. Take into consideration existing and reasonably expected future land use when developing basin hydrology and use the most critical condition in the final design.

____ Copy of the flood routings including an input summary sheet.

____ Downstream hazard class assessment. Take into consideration potential future downstream development.

____ Description of foundation/site preparation.

____ Certification that the impoundment at the emergency spillway elevation (top of dam elevation if there is not an emergency spillway) is no closer than 500 feet (1000 feet for a dam on a major water source) from a confinement feeding operation structure. A confinement feeding operation structure means a confinement building, manure storage structure or an egg washwater storage structure that is part of a confinement feeding operation. Please refer to Table 1 in 567 IAC 65 for a listing of major water sources.

Additional Requirements for Major Dam Structures

A major dam structure is defined as a dam meeting any of the following criteria.

1. Any high hazard dam.
2. Any moderate hazard dam with a permanent storage exceeding 100 acre-feet or a total of permanent and temporary storage exceeding 250 acre-feet at the top of the dam elevation.
3. Any dam, including low hazard dams, where the height of the emergency spillway crest measured above the elevation of the channel bottom at the centerline of the dam (in feet) multiplied by the total storage volume (in acre-feet) to the emergency spillway crest elevation exceeds 30,000. For dams without emergency spillways, these measurements shall be taken to the top of dam elevation.

In addition to the above noted requirements, the following information must be submitted for the Department's consideration of the project.

____ Soils and foundation investigation report.

____ Proof that the applicant owns or has flood easements on all upstream lands that would be affected by the proposed impoundment at the top of dam elevation.

____ Report assessing the sedimentation rates of the contributing watershed and their impact on the life and usefulness of the impoundment.

____ Dam failure analysis and breach inundation mapping. At a minimum, the failure analysis will need to include the two following scenarios: a sunny day failure with the pool at normal level (at the principal spillway crest elevation) and an overtopping failure. If the dam is designed using the probable maximum flood then the failure analysis need only assume failure at the maximum pool elevation.

____ A gated low level outlet shall be provided. It must be capable of draining at least 50% of the permanent volume of the pool within a reasonable length of time. The low level outlet shall be designed so that the draw down rate does not exceed one foot per day.